



Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

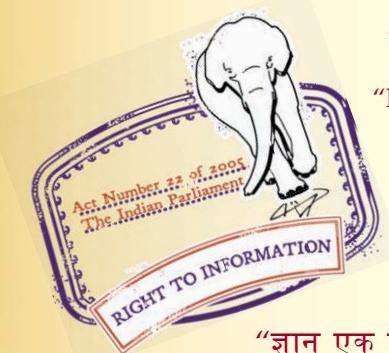
“Step Out From the Old to the New”

IS 10932 (1984): Palmitic Acid [FAD 13: Oils and Oilseeds]

“ज्ञान से एक नये भारत का निर्माण”

Satyanaaran Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartṛhari—Nītiśatakam

“Knowledge is such a treasure which cannot be stolen”



BLANK PAGE



PROTECTED BY COPYRIGHT

Indian Standard
SPECIFICATION FOR
PALMITIC ACID

UDC 661.7 = 547.295.92



© Copyright 1984

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR PALMITIC ACID

Oils and Oilseeds Sectional Committee, CAFDC 5

Chairman

PROF M. M. CHAKRABARTY

Representing

Oil Technologists Association of India, Kanpur

Members

PROF A. C. GUPTA (Alternate to	
Prof M. M. Chakrabarty)	
SHRI S. N. AGARWAL	Central Organization for Oil Industry and Trade, Bombay
SHRI H. P. GUPTA (Alternate)	
AGRICULTURAL MARKETING ADVISER TO THE GOVERNMENT OF INDIA	Directorate of Marketing and Inspection, Nagpur
SHRI R. J. VERMA (Alternate)	
SHRI J. A. ASHTAPUTRE	Ministry of Defence (DGI)
SHRI P. N. AGARWAL (Alternate)	Tata Oil Mills Co Ltd, Bombay
DR B. P. BALIGA	
DR N. L. MURTY (Alternate)	Swastik Household and Industrial Products Ltd, Bombay
SHRI M. A. BHATT	
SHRI C. R. KRISHNAMURTHY (Alternate)	Hindustan Lever Ltd, Bombay
DR N. V. BRINGI	
DR V. V. S. MANI (Alternate)	Central Committee for Food Standards (Ministry of Health and Family Welfare), New Delhi
SHRI D. S. CHADHA	
SHRIMATI DEBI MUKHERJEE (Alternate)	National Test House, Calcutta
SHRI P. K. CHAKRABORTY	Central Food Laboratory, Calcutta
DR K. C. GUHA	
SHRI A. K. DHAR (Alternate)	Khadi and Village Industries Commission, Bombay
SHRI P. V. GUJARATHI	
SHRI V. LAKSHMIKANTHAN (Alternate)	Directorate General of Technical Development, New Delhi
SHRI R. C. GUPTA	
SHRI S. N. PANDEY (Alternate)	Kusum Products Ltd, Rishra
SHRI S. P. GUPTA	
SHRI A. R. N. KULU (Alternate)	

(Continued on page 2)

© Copyright 1984

INDIAN STANDARDS INSTITUTION

This publication is protected under the *Indian Copyright Act (XIV of 1957)* and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

(Continued from page 1)

Members

SHRI B. V. KANTAK	<i>Representing</i>
SHRI M. S. THAKUR (Alternate)	Godrej Soaps Ltd, Bombay
DR M. K. KUNDU	DIRECTORATE OF VANASPATI, VEGETABLE OILS AND FATS (MINISTRY OF CIVIL SUPPLIES), NEW DELHI
DR G. LAKSHMINARAYANA	REGIONAL RESEARCH LABORATORY (CSIR), HYDERABAD
DR A. J. PANTULU (Alternate)	
DR B. M. LAL	INDIAN AGRICULTURAL RESEARCH INSTITUTE (ICAR), NEW DELHI
SHRI T. V. MATHEW	CENTRAL AGMARK LABORATORY, NAGPUR
SHRI M. R. GROVER (Alternate)	
SHRI R. K. MATHUR	VANASPATI MANUFACTURERS' ASSOCIATION OF INDIA, BOMBAY
SHRI G. K. SOOD (Alternate)	
SHRI S. C. SINGHAL	SHRIRAM FOODS & FERTILIZER INDUSTRIES, NEW DELHI
SHRI T. N. AGGARWAL (Alternate)	
SHRI G. V. SIRUR	SOLVENT EXTRACTORS' ASSOCIATION OF INDIA, BOMBAY
SHRI L. KRISHAN KUMAR (Alternate)	
DR (SHRIMATI) KAMLA SOHNIE	CONSUMER GUIDANCE SOCIETY OF INDIA, BOMBAY
DR C. SRINIVASULU	REGIONAL RESEARCH LABORATORY (CSIR), BHUBANESHWAR
DR (SHRIMATI) K. VIJAYALAKSHMI (Alternate)	
SHRI S. D. THIRUMALA RAO	Oil TECHNOLOGICAL RESEARCH INSTITUTE, ANANTAPUR
SHRI G. AZEEMODDIN (Alternate)	
SHRI P. R. VISHWAMBHARAN	CENTRAL WAREHOUSING CORPORATION, NEW DELHI
SHRI K. GOPINATHA MENON (Alternate)	
SHRI M. D. WASNIK	DIRECTORATE OF OILSEEDS DEVELOPMENT, HYDERABAD
SHRI S. P. JUYAL (Alternate)	
SHRI S. K. MATHUR, Director (Chem)	DIRECTOR GENERAL, ISI (<i>Ex-officio Member</i>)

Secretary

SHRI P. S. ARORA
Senior Deputy Director (Chem), ISI

Oils and Fats Subcommittee, CAFDC 5 : 1

Convenor

DR G. LAKSHMINARAYANA Regional Research Laboratory (CSIR), Hyderabad

Members

**AGRICULTURAL MARKETING
ADVISER TO THE GOVERNMENT
OF INDIA** DIRECTORATE OF MARKETING AND INSPECTION, NAGPUR

SHRI T. V. MATHEW (Alternate)

(Continued on page 11)

Indian Standard

SPECIFICATION FOR PALMITIC ACID

0. F O R E W O R D

0.1 This Indian Standard was adopted by the Indian Standards Institution on 30 March 1984, after the draft finalized by the Oils and Oilseeds Sectional Committee had been approved by the Chemical Division Council and the Agricultural and Food Products Division Council.

0.2 Palmitic acid is a saturated fatty acid having 16 carbon atoms. Its molecular formula is $\text{CH}_3(\text{CH}_2)_{14}\text{COOH}$ with 256·4 as its molecular weight. It is a crystalline solid with a faint characteristic farry odour. It is a major fatty acid of palm oil (*Elaeis guineensis* Jacq.), lard and tallow.

0.2.1 Commercially, palmitic acid is obtained from palmitic rich oils by fractional distillation of their fatty acids. By repeated fractionation steps, palmitic acid of 99 percent purity can be made.

0.3 Palmitic acid is a raw material for making cetyl alcohol. It also finds important use in making palmityl chloride which is ultimately used for making vitamin A palmitate. It has other wide variety of applications in paints, cosmetics, etc.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for palmitic acid.

2. GRADES

2.1 The material shall be of three grades, namely, Grade 1, Grade 2 and Grade 3.

*Rules for rounding off numerical values (*revised*).

3. REQUIREMENTS

3.1 Description — Palmitic acid shall be the product obtained by splitting palmitic acid rich oils like palm oil, lard, tallow, etc, and fractionating the fatty acids suitably. It shall be clear when melted and free from adulterants, sediments, suspended and other foreign matter. Palmitic acid may also contain minor proportion of C₁₂-C₁₈ fatty acids.

3.2 The material shall also comply with the requirements given in Table 1.

4. PACKING AND MARKING

4.1 Packing — The material shall be supplied in suitable containers as agreed to between the purchaser and the supplier.

4.2 Marking — The containers shall be securely closed and legibly and indelibly marked with the following information:

- a) Manufacturers' name and recognized trade-mark, if any;
- b) Name and grade of the material;
- c) Net mass of the material;
- d) Batch number or lot number in code or otherwise; and
- e) Month and year of manufacture.

4.2.1 The containers may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

5. SAMPLING

5.1 Representative samples of the material shall be drawn and conformity of the material to the requirements of this specification shall be determined according to the procedure prescribed in Appendix B.

6. TESTS

6.1 Tests shall be carried out by method prescribed in col 6 of Table 1 and Appendix A.

TABLE 1 REQUIREMENTS FOR PALMITIC ACID(*Clauses 3.2 and 6.1*)

SL No.	CHARACTERISTIC	REQUIREMENT FOR			METHOD OF TEST, REF TO		
		Grade 1	Grade 2	Grade 3	Cl. No. in IS : 548 (Part 1)- 1964*	Appendix	Indian Stand- ard
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i)	Palmitic acid, percent by mass, <i>Min</i>	99.0	90.0	70.0	—	—	IS : 548 (Part 3)- 1976†
ii)	Moisture, percent by mass, <i>Max</i>	0.1	0.1	0.1	5.2	—	—
iii)	Saponification value	217-219	216-222	214-224	15	—	—
iv)	Acid value shall not differ from saponification value by more than	4	4	4	7	—	—
v)	Iodine value, <i>Max</i>	0.5	1.0	2.0	14	—	—
vi)	Mineral acidity	Nil	Nil	Nil	—	A-1	—
vii)	Ash, percent by mass, <i>Max</i>	0.01	0.01	0.02	—	A-2	—
viii)	Unsaponifiable matter, percent by mass, <i>Max</i>	0.1	0.2	0.2	8	—	—
ix)	Titre	61-62.5	57-62	57-62	12	—	—
x)	Colour, 5½-in cell, 2 units <i>Y + 5 R, Max</i>	7 units	10 units	13	—	—	—

*Methods of sampling and test for oils and fats: Part 1 Sampling, physical and chemical tests (*revised*).

†Methods of sampling and test for oils and fats: Part 3 Analysis by gas liquid chromatography.

APPENDIX A

[*Clause 6.1; and Table 1, Item (vi) and (vii)*]

TEST FOR MINERAL ACIDITY AND ASH

A-1. TEST FOR MINERAL ACIDITY

A-1.1 Quality of Reagents — Unless specified otherwise, pure chemicals and distilled water (*see IS : 1070-1977**) shall be employed in tests.

*Specification for water for general laboratory use (*second revision*).

NOTE—‘Pure chemicals’ shall mean chemicals that do not contain impurities which affect the results of analysis.

A-1.2 Reagents — The following reagents are required.

A-1.2.1 Methyl Orange Indicator — 0·05 percent (*w/v*) solution.

A-1.2.2 Light Petroleum Ether (60°C/80°C).

A-1.3 Procedure — Measure 10 ml of the melted sample into a separating funnel and shake intimately with three successive 10 ml portion of hot water. The temperature of the hot water should be more than the melting point of palmitic acid. Combine the aqueous extracts, transfer to another separating funnel and remove traces of fatty acids in the water by extraction with light petroleum ether. Test the aqueous extract so obtained with a few drops of methyl orange indicator.

A-1.4 The material shall be taken to have satisfied the requirements of the test if the indicator does not show acid reaction.

A-2. DETERMINATION OF ASH

A-2.1 Apparatus

A-2.1.1 Platinum Crucible

A-2.1.2 Desiccator — containing an efficient desiccant, such as fused calcium chloride.

A-2.2 Procedure — Weight accurately about 10 g of the air-dried material into a platinum crucible which has been previously dried, cooled in the desiccator and weighed. Heat the crucible over a low flame and ignite the contents gently. Incinerate the residue in a muffle furnace at $550 \pm 10^\circ\text{C}$ until free from carbon. Cool the crucible in a desiccator and weigh. Repeat the above procedure of heating, cooling and weighing until the difference between two successive weighings does not exceed 1 mg.

A-2.3 Calculation

$$\text{Ash, percent by mass} = \frac{100 m}{M}$$

where

m = mass in g of the ash, and

M = mass in g of the material taken for the test.

A P P E N D I X B

(Clause 5.1)

SAMPLING OF PALMITIC ACID

B-1. GENERAL REQUIREMENTS OF SAMPLING

B-1.0 In drawing, preparing, storing and handling test samples, the following precautions and directions shall be observed.

B-1.1 Samples shall not be taken in an exposed place.

B-1.2 The sampling instrument shall be clean and dry when used.

B-1.3 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument and the containers for samples from adventitious contamination.

B-1.4 To draw a representative sample, the contents of each container selected for sampling shall be mixed as thoroughly as possible by suitable means.

B-1.5 The samples shall be placed in clean, dry glass stoppered bottles.

B-1.6 The samples containers shall be of such a size that they are almost completely filled by the sample.

B-1.7 Each sample container shall be sealed air-tight after filling and marked with full details of sampling, the date of sampling and the year and month of manufacture of the material.

B-1.8 Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the normal temperature.

B-2. SCALE OF SAMPLING

B-2.0 Samples to determine conformity of the material to this specification shall be selected in accordance with the procedure given below. However, the purchaser and the supplier may agree to adopt any other procedure.

B-2.1 Lot — All the containers in a single consignment of one grade of the material drawn from a single batch of manufacture shall constitute the lot. If a consignment is declared to consist of different batches of manufacture, the batches shall be marked separately and the groups of containers in each batch shall constitute separate lots.

B-2.2 The number of containers to be selected from a lot shall depend upon the size of the lot and shall be in accordance with col 1 and 2 of Table 2.

TABLE 2 NUMBER OF CONTAINERS TO BE SELECTED FROM VARIOUS SIZES OF LOTS

LOT SIZE <i>N</i>	NUMBER OF CONTAINERS TO BE SELECTED	
	<i>n</i>	(2)
Up to 5	All (see Note)	
6 to 65	5	
66 to 110	7	
Over 110	10	

NOTE — When the lot size is 5 or less, the test results of each of the samples shall meet the corresponding requirement.

B-2.3 These containers shall be selected at random from the lot. In order to ensure the randomness of selection, procedures given in IS : 4905-1968* may be followed.

B-3. TEST SAMPLES AND REFEREE SAMPLE

B-3.1 Draw with an appropriate sampling instrument small portions of the material from different parts of the selected containers, the total quantity being sufficient to carry out the tests for all characteristics given in Table 1.

B-3.2 Mix thoroughly all portions of the material drawn from the same container to form an individual sample to represent the container. Equal quantities from the selected containers shall be mixed together to form a composite sample to represent the lot.

B-3.3 All the individual samples representing the selected containers and the composite sample representing the lot shall be divided into three equal parts, thus forming three sets of test samples. These parts shall be immediately transferred to thoroughly dried bottles which shall then be sealed air-tight with glass stoppers. These shall be labelled with all the particulars of sampling given in **B-1.7**. One set of the test samples shall be sent to the purchaser and one to the supplier.

*Methods of random sampling.

B-3.4 Referee Sample — The third set of the test samples, bearing the seals of the purchaser and the supplier, shall constitute the referee sample and shall be used in case of dispute between the purchaser and the supplier. It shall be kept at a place agreed to between the purchaser and the supplier.

B-4. NUMBER OF TESTS

B-4.1 The tests for saponification value, acid value and titre (*see* Table 1) shall be carried out on each individual sample of the set of test samples (*see* B-3.3).

B-4.2 The tests for the remaining characteristics given in Table 1 shall be carried out on the composite sample of the set of test samples (*see* B-3.3).

B-5. CRITERION FOR CONFORMITY

B-5.1 A lot shall be considered as conforming to this specification if it satisfies the criteria in B-5.2.1 and B-5.3 for the characteristics given in Table 1.

B-5.2 The test results for saponification value, acid value and the titre shall be recorded as shown in Table 3. The mean and the range shall be calculated as follows and shall be recorded in col 4 and 5, respectively, of Table 3.

$$\text{Mean } (\bar{X}) = \frac{\text{The sum of the test results}}{\text{Number of test results}}$$

$$\text{Range } (R) = \text{The difference between the maximum and the minimum values of the test results}$$

B-5.2.1 The corrected mean as shown in col 6 of Table 3 shall be calculated. The lot shall be considered to have satisfied the requirement for a characteristic if the condition given in col 7 of Table 3 is satisfied.

B-5.3 The composite sample when tested for the remaining characteristics not tested in B-5.2 shall satisfy the corresponding requirements for them as specified in Table 1.

TABLE 3 CRITERION FOR CONFORMITY
(Clauses B-5.2 and B-5.2.1)

SL No.	CHARACTER- ISTIC	TEST RESULTS 1, 2, 3. . .	MEAN (3)	RANGE (4)	CORRECTED MEAN (5)	CRITERION FOR CONFORMITY (6)	(7)
i)	Saponification value		\bar{X}_1	R_1	$\bar{X}_1 - 0.6 R_1$	Corrected mean \geq specified value in Table 1(ii)	
ii)	Acid value		X_2	R_2	$\bar{X}_2 - 0.6 R_2$	Corrected mean $>$ specified value in Table 1(iii)	
iii)	Titre		\bar{X}_3	R_3	$\bar{X}_3 \pm 0.6 R_3$	Corrected mean $<$ specified value in Table 1(viii)	

(Continued from page 2)

<i>Members</i>	<i>Representing</i>
SHRI J. A. ASHTAPUTRE	Ministry of Defence (DGI)
SHRI P. K. MAJUMDAR (Alternate)	
ASSISTANT DIRECTOR (AGRI ENGG)	Indian Council of Agricultural Research Institute, New Delhi
SHRI V. K. BANSAL	Central Organization for Oil Industry and Trade, Bombay
SHRI H. P. GUPTA (Alternate)	Hindustan Lever Ltd, Bombay
DR N. V. BRINGI	
DR V. V. S. MANI (Alternate)	Central Committee for Food Standards (Ministry of Health and Family Welfare), New Delhi
SHRI D. S. CHADHA	
SHRIMATI DEBI MUKHERJEE (Alternate)	Directorate General of Technical Development, New Delhi
SHRI R. D. KAWATRA	
SHRI V. LAKSHMIKANTHAN	Khadi and Village Industries Commission, Bombay
SHRI V. K. B. NAIR (Alternate)	
SHRI R. K. MARPBATIA	Indian Paint Association, Calcutta
SHRI RABIN SARKAR (Alternate)	
SHRI R. K. MATHUR	Vanaspati Manufacturers' Association of India, Bombay
SHRI G. K. SOOD (Alternate)	
DR N. L. MURTY	Tata Oil Mills Co Ltd, Bombay
DR A. D. SHITOLE (Alternate)	
DR S. M. PATEL	Oil Technologists' Association of India, Kanpur
PROF V. V. R. SUBRAHMANYAM (Alternate)	
DR J. V. PRABHAKAR	Central Food Technological Research Institute (CSIR), Mysore
SHRI R. D. SHENOI	Indian Confectionery Manufacturers' Association, New Delhi
DR I. S. SHENOLIKAR	Indian Council of Medical Research, New Delhi
DR RAMESH BHATT (Alternate)	
DR I. A. SIDDIQUI	Directorate of Vanaspati; Vegetable Oils and Fats (Ministry of Civil Supplies), New Delhi
DR R. A. KHAN (Alternate)	
SHRI M. S. THAKUR	Indian Soap and Toiletries Makers' Association, Bombay; and Godrej Soaps Ltd, Bombay
SHRI S. D. THIRUMALA RAO	
SHRI D. ATCHYUTA RAMAYYA (Alternate)	Oil Technological Research Institute, Anantapur
SHRI M. D. WASNIK	
SHRI S. P. JUYAL (Alternate)	Directorate of Oilseeds Development, Hyderabad